Dr. C. Schuchert
with regards of
H. F. Wickham

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A report on some recent collections of Fossil Coleoptera from the Miocene Shales of Florissant

BY

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IOWA CITY, IOWA

May 15, 1912

A REPORT ON SOME RECENT COLLECTIONS OF FOSSIL COLEOPTERA FROM THE MIOCENE SHALES OF FLORISSANT.

H. F. WICKHAM

Within the past five or six years, the historic locality of Florissant, Colorado, has been revisited several times by parties under the direction of Professor T. D. A. Cockerell, of the University of Colorado, for the purpose of making fresh collections of the fossil insects abounding in the shales of the ancient lake bed. These expeditions have been successful in bringing to light a great number of hitherto unknown species, and in securing additional specimens of many forms already known. Some of the material has been worked up by Professor Cockerell himself, other portions by Professor Brues and Mr. Beutenmueller, while most of the Coleoptera have at length come into my hands for study. A good share of these were transmitted directly by Professor Cockerell, others came through the American Museum of Natural History. I have also had some specimens from the Peabody Museum and am now engaged in finishing a report on the collection of Florissant Coleoptera belonging to the United States National Museum. The new species from the last named source will be published elsewhere, but I have made an occasional note upon them in the present paper and have also referred to a few of the names which are still in manuscript. It is my hope to publish tables of some of the genera when all of the collections are finished, and the intention is to get out a list in which the Florissant beetle fauna will be shown as nearly in its entirety as possible. This seems the more desirable since Dr. Scudder was interrupted in his work by ill health and had only begun the non-Rhynchophorous series.

Until the remainder of the collections in hand are studied, it is scarcely worth while to make any extended remarks on the peculiarities of this Miocene fauna. Dr. Scudder has already called attention to some of the most striking characteristics of beetle

life on the old lake shore, but it will probably be necessary to modify his conclusions regarding relative prevalence of certain families. The remarkable preponderance of Rhynchophora which he noted seems well sustained in recent collections, and the development of the Rhynchitidæ, a family of this series, is even more pronounced than he had judged. The Rhynchophora were undoubtedly a dominant type of beetle during the Miocene times. None of the other groups approach them in richness of species or individuals. They had already developed specialized rostral and scale structures, as shown by the remains from Florissant. It is interesting to note that the so-called seed weevils, the Bruchidæ, had also a strikingly strong representation in this region, seven species being described in the present paper, and another, of a more specialized type, being figured and described in manuscript. These seven species show varying modifications of the antennæ and indicate that the femoral dentation so well developed in recent forms had already made some progress in the Tertiary. The wood boring Bostrychids, *Protapate* and *Xylobiops* are also well along in development of the peculiar sculpture of the group to which they belong.

I must confess that I have not been able to find the affinities with the Central American fauna that Dr. Scudder seemed to suspect. Time after time, I have compared the species of certain genera with their Mexican or Central American representatives, but have nearly always found them more closely related to those of the United States. Even the European fauna does not seem to have been any more closely approximated than our own, and when I have been unable to assign a beetle to one of our native genera it has almost always been necessary to erect a new genus for its accommodation. The case of *Paussopsis*, as showing a possible striking affinity to the African or European fauna is not so convincing as it might be. I am not at all sure that this beetle belongs to the Paussidæ, though for the present I follow Professor Cockerell in the assumption that it does.

Such characters as the expanded tarsi of the males in Carabidæ, Staphylinidæ and water beetles had already made their appearance in the Tertiary forms. Bizarre structures of any description are somewhat conspicuously lacking. I do not see that there is any well marked difference in the average size of

the recent beetles of given genera when compared with their presumed relatives of the Miocene rocks, though an occasional specimen has been assigned to one genus or another as a large or small exponent thereof. No really large family or series of families seems to be entirely wanting, unless it be the Pselaphidæ or the Histeridæ, of which latter Dr. Scudder mentions seeing a specimen though none is described in any of his papers. I have seen nothing that can possibly belong there, in spite of the fact that the genus *Saprinus* is today a common inhabitant of lake shores and the texture of the exoskeleton is such that there would be no doubt of its preservation as a fossil if deposited in the mud at one of the periods of shale formation. Small coleoptera of all families are extremely few in the collections though this may perhaps mean that they have been overlooked by field investigators. Thus, no Trichopterygidæ, Pselaphidæ or Scydmænidæ have been described, nor have I seen any. In the Clavicorn families now well represented along the forested shores of inland waters nearly all of the smaller forms seem to have been undeveloped or to have been lost after their entombment.

All of the drawings are from camera lucida figures by the author, except those of *Protapate* and *Macrodactylus* which are free hand. No structures have been "restored" but in case of such sculpturing as lines of fine punctures the courses of these lines have been indicated without attempting to reproduce each individual point. Attention has been called in the text to all such diagramatic representation and it is always accompanied by a detail figure on a larger scale or by a definite verbal description.

Arranged by families, the species herein reported upon are as follows:

CARABIDÆ.

Trechus fractus n. sp.
Amara cockerelli n. sp.
Amara danæ *Scudd.*

DYTISCIDÆ.

Cœlambus miocenus n. sp.
Agabus charon n. sp.

SILPHIDÆ.

Miosilpha necrophiloides n. sp.

PAUSSIDÆ.

Paussopsis secunda n. sp.

STAPHYLINIDÆ.

Quedius mortuus n. sp.
Quedius chamberlini *Scudd.*
Staphylinus lesleyi *Scudd.*
Leptacinus leidyi *Scudd.*
Tachinus sommatus *Scudd.*
Tachyporus nigripennis *Scudd.*

Boletobius funditus *Scudd.*
Mycetoporus demersus *Scudd.*
Bledius osborni *Scudd.*
Deleaster grandiceps n. sp.

COCCINELLIDÆ.

Adalia subversa *Scudd.*

EROTYLIDÆ.

Tritoma submersa n. sp.
Tritoma materna n. sp.

COLYDIIDÆ.

Phlœonemites miocenus n. sp.

DERMESTIDÆ.

Dermestes tertiarius n. sp.
Orphilus dubius n. sp.

NITIDULIDÆ.

Amartus petrefactus n. sp.

BYRRHIDÆ.

Nosotetocus vespertinus *Scudd.*

PARNIDÆ.

Dryops tenuior n. sp.
Lutrochites lecontei n. sp.

BUPRESTIDÆ.

Anthaxia exhumata *Wickh.*
Melanophila cockerellæ n. sp.
Melanophila handlirschi n. sp.
Acmæodera schaefferi n. sp.
Acmæodera abyssa n. sp.

LAMPYRIDÆ.

Pyropyga prima n. sp.

MALACHIDÆ.

Eudasytites listriformis n. sp.
Trichochrous miocenus n. sp.

BOSTRYCHIDÆ.

Protapate contorta n. sp.
Xylobiops lacustre n. sp.

SCARABÆIDÆ.

Atænius patescens *Scudd.*
Aphodius aboriginalis n. sp.
Aphodius restructus n. sp.
Aphodius shoshonis n. sp.
Aphodius laminicola *Wickh.*
Serica antediluviana n. sp.
Macrodactylus pluto n. sp.
Macrodactylus propheticus n. sp.
Diplotaxis simplicipes n. sp.
Diplotaxis aurora *Wickh.*

CERAMBYCIDÆ.

Leptura petrorum n. sp.

CHRYSOMELIDÆ.

Donacia primæva n. sp.
Crioceridea dubia n. sp.
Metachroma florissantensis n. sp.

BRUCHIDÆ.

Bruchus henshawi n. sp.
Bruchus exhumatus n. sp.
Bruchus bowditchi n. sp.
Bruchus florissantensis n. sp.
Bruchus scudderi n. sp.
Bruchus haywardi n. sp.
Bruchus osborni n. sp.

TENEBRIONIDÆ.

Platydema antiquorum n. sp.

MORDELLIDÆ.

Mordellistena florissantensis n. sp.

MELOIDÆ.

Nemognatha exsecta n. sp.

RHYNCHITIDÆ.

Docirhynchus ibis n. sp.

CURCULIONIDÆ.

Pachybaris rudis n. sp.

TRECHUS *Clairv.*

T. FRACTUS n. sp. (Plate III, Fig. 1.) Form moderately elongate. Head rather large, not constricted posteriorly, mandibles strong, about as long as the rest of the head. Antennæ broken, but the few remaining joints rather stout. Prothorax trapeziform, much broader at apex and strongly narrowed to the base, sides almost straight, front coxæ narrowly separated by the prosternum. Elytra without humeral angles, broadest a little in front of the middle, apices broken, striæ, as shown through the abdomen, fine. Length, 7.00 mm.

Station number and collector not specified. The type and only known specimen was received directly from Professor Cockerell and is in the Museum of the University of Colorado.

This insect has given me a good deal of trouble to place. It reminds one of the slender Platyni of the *'larvalis* group, and is also similar to some of the European Anophthalmi. The lack of a strongly defined neck has led me to prefer *Trechus* as a final disposition, in preference to *Platynus*, but I cannot say that I am very well satisfied with the assignment.

AMARA *Bonelli.*

A. COCKERELLI n. sp. (Plate I, Fig. 1.) Intermediate in size between *A. powellii*, and *A. danæ*, from these shales, but in form more like *A. revocata.* A species is indicated in which the prothorax was narrower behind as in the recent subgenus *Cyrtonotus*, this segment being broadest well in front of the middle, whence the sides are arcuate to the anterior angles, which are not prominent, posteriorly they are nearly straight and only slightly sinuate to the base, thoracic disk without distinct sculpture except a strong median line. Head as broad at base as the prothoracic apex. Eyes rather small and anterior as in all of the species described by Dr. Scudder. Elytra with finely impressed narrow striæ, apparently impunctate and about equally distinct to the lateral margins, scutellar stria free at tip and moderately long. Legs and antennæ wanting. Length, 9.25 mm.; of elytron, 5.50 mm. Width of elytra, 3.75 mm.

Station number 11 or 12. One specimen, showing obverse and reverse, with the collection numbers 70 and 191. The type is in the Museum of the University of Colorado. It was collected by Professor Cockerell, for whom it is named.

This fossil seems undoubtedly distinct from any of Dr. Scudder's species and like them is doubtfully a true representative of the genus. Except for the great difference in size, I should have referred it to *A. revocata*, the figure of which it fairly closely resembles, especially in the form of the prothorax.

A. DANÆ SCUDD. Station number 13. A fine paired specimen from this place was collected by S. A. Rohwer.

CŒLAMBUS *Thoms.*

C. MIOCENUS n. sp. (Plate II, Figs. 1 to 6.) Form scarcely elongate for this genus, tapering towards both ends. Head large, antennæ not well preserved but sufficiently well shown to indicate that they were rather stout. Prothorax possibly not complete at the sides but in general tapering from

about the base to the apex. Elytra broadest a little in front of the middle, the length of each a little more than twice the breadth. Entire upper surface with a fine alutaceous sculpture, visible only under high magnification. Under side better preserved than the upper and much more roughly sculptured, the punctuation being strongly pronounced and coarse, the punctures circular and separated generally by much less than their own diameters. In front of the middle coxæ, these punctures are comparatively fine but behind them, on the sternal pieces and especially on the coxal plates they are large, taking into account the size of the insect. The abdomen is about equally coarsely but somewhat less strongly punctured, toward the base, but much more finely on the last two segments. Legs rather slender, the anterior and middle tarsi somewhat dilated. Length, 3.75 mm. Width across both elytra at broadest point, 2.40 mm.

Station number 14. One beautiful paired specimen, collected by Geo. N. Rohwer. The type is in the American Museum of Natural History.

I refer this insect to *Cœlambus* without the least hesitation, the shape, sculpture, and structural features all point to the same conclusion. It seems to have had more likeness to *C. medialis* than to any other of our recent North American species, but was more finely punctured above.

AGABUS *Leach.*

A. CHARON n. sp. (Plate IV, Fig. 1.) Form almost regularly elliptical, broadest about the middle of the body length. Head large, and, as preserved, longer than the prothorax when viewed from beneath, about equal to it when seen from above, no distinct sculpture aside from a fine alutaceous roughening which also covers the upper surfaces of the prothorax and elytra. Prothorax short, about three times as broad as long in dorsal view, sides nearly straight or slightly arcuate, convergent from base to apex. Elytra at base not quite continuing the prothoracic outline, conjointly nearly one and one-fourth times as long as broad, without striation or evidence of coarse punctures. Legs rather short. Length from front of head to elytral apex, 8.25 mm.; of elytra, 6.00 mm. Width across both elytra at widest point, about 4.75 mm.

Station number 14. One paired specimen, collected by Mrs. W. P. Cockerell or S. A. Rohwer. The type is in the Museum of the University of Colorado.

This insect probably belongs with *Agabus,* judging from the form, size, short legs, and such of the ventral sclerites as can be made out. It is, of course, possible that it should form a separate genus, but no characters are apparent upon which to base a division. It is readily distinguished from the fossil *A. florissan-*

tensis by the much smaller size, which is only about three-fourths that of the latter species.

MIOSILPHA n. gen.

Form of *Silpha*, for example *S. lapponica*, but differs in having the middle coxæ quite closely approximate or possibly contiguous. The front coxæ are transverse, the cavities confluent, hind coxæ also transverse and contiguous. The flanks of the prothorax are inflexed and the elytra have a wide inflexed margin. Antennæ apparently ten jointed, with a four jointed club, but it is possible that there were eleven joints. The type and only known species is described below.

M. NECROPHILOIDES n. sp. (Plate I, Figs. 4, 5, 6.) Moderately elongate in form. Head short, distinctly and strongly but not especially coarsely punctured above and beneath, closely on the vertex, less so on the occiput, and sparsely on the front. Eye rounded, small as seen from above. Antenna apparently ten jointed, the first joint long and stout, second small, third as long as the next two, fourth, fifth and sixth subequal, seventh, eighth, ninth, and tenth forming a moderately strong club which is somewhat shorter than all the joints from the second to the sixth inclusive. Prothorax distorted but approximately twice as wide as long, upper surface distinctly but sparsely punctured, a little more coarsely and closely towards the sides. Scutellum finely punctured, triangular. Elytra nearly parallel sided, not notably differing, in conjoint width, from the prothorax, the surface of each with nine sharp, fine, nearly equidistant striæ, which nearly attain the elytral apices, their bottoms apparently finely indistinctly punctate, interstitial spaces broad, a little convex, probably each with a few coarse punctures, though this appearance may perhaps be due to the structure of the stone. Front tibia carinate, the others not distinct. Underside of prothorax moderately finely, quite sparsely punctured, that of the meso and metathorax still more finely; on all of these, and on the abdomen, the punctuation is coarser at the sides, the middle abdominal region being almost smooth. Length to apex of extended abdomen, 9.00 mm.; of elytra, 3.50 mm.

Station number 14. There are two paired specimens, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado, the cotype in the American Museum of Natural History.

This very interesting insect seems without doubt to be a Silphid. I should place it in the tribe Silphini, with which it agrees in having transverse anterior coxæ, with trochantins, the cavities confluent and open behind, the hind coxæ simple and contiguous. The exposed abdomen and ten jointed antennæ ally it to *Necrophorus* in which, however, the club is capitate while in *Miosilpha* it is long and not very compact as in *Silpha* and

Necrophilus. The contiguous or closely approximate middle coxæ separate it at once from *Silpha,* but in this respect it is similar to *Necrophilus,* which genus it also closely resembles in sculpture and in the carination of the tibiæ. It is, in fact, about like a *Necrophilus* with ten jointed antennæ, truncate elytra, and elongate abdomen, the last character probably being exaggerated by maceration. If we should attempt to incorporate it in the table of genera in the LeConte and Horn "Classification" it might be placed after *Necrophorus* from which it differs by the characters already given. It may be worth while to call attention to the fact that it seems an osculant form between *Necrophorus* and *Silpha,* two genera which are readily distinguishable at the present day, and that it combines the coxal structure of the forms with long elytra (represented today by *Necrophilus* and *Pelates*) with the short elytra of the two genera mentioned above.

Paussopsis *Ckll.*

P. SECUNDA n. sp. (Plate I, Figs. 8, 9.) Form moderately elongate, subparallel. Head longer than the prothorax. Eye large, circular. Antennæ hardly clavate but thick, basal joint a little longer than the three succeeding, second smallest, those following are subequal among themselves except the last which is larger and apparently rounded at the tip. The vertex and occipital region are closely but finely punctured, the frontal region more finely and less closely. Prothorax shown partly in side view, and, as preserved, much wider than long, distinctly margined behind, the outline regular, surface smooth and shining, (probably polished in life) with extremely fine, microscopic, widely dispersed punctures. Elytra subparallel at sides, bluntly pointed at tip, surface scarcely visibly sculptured but with some indications of extremely fine lines of punctures. Length, 6.25 mm.

Station number 14. One specimen, collected by Geo. N. Rohwer. The type is in the Museum of the University of Colorado.

This seems to be congeneric with *P. nearctica* Ckll., with which it agrees in most of the specific details as well, but *P. secunda* is a little larger, the antennæ, judging from the figure, less clavate and the head punctured. If *Paussopsis* really belongs to the Paussidæ, it must be considered a very generalized form, since neither the antennæ, the head, nor the prothorax exhibit any development of the peculiar distortions common among recent species in that family.

QUEDIUS *Steph.*

Q. MORTUUS n. sp. (Plate I, Fig. 2.) Form elongate, parallel. Head long, rather narrow, tapering behind the eyes which are large but not very prominent. Antennæ wanting. Prothorax wider than the head, but about equal in length and breadth, apex narrower than the base which is rounded, sides nearly regularly arcuate. Scutellum large, subtriangular. Elytra conjointly but little wider than the prothorax, sinuately truncate at apices, their combined width slightly exceeding their length. Abdomen nearly as broad as the elytra, strongly margined, only the basal three segments remaining. Legs wanting. Length of fragment, 11.45 mm.; from front of head to elytral apex, 7.60 mm.; of elytra, 2.80 mm. Width of prothorax, 2.80 mm.; of elytra, about 3.00 mm.

Station number 14. Collected by S. A. Rohwer. The type and only specimen is in the American Museum of Natural History.

This appears to be a *Quedius* of the *explanatus* type and is of similar size. The sculpture of the entire upper surface is very fine and seems scarcely more than an alutaceous roughening of the integuments. In life, the insect probably reached a length of about 15 mm.

Q. CHAMBERLINI *Scudd.* Station number 17. One paired specimen, collected by S. A. Rohwer.

STAPHYLINUS *Linn.*

S. LESLEYI *Scudd.* Station number 13B. One paired specimen, collected by Geo. N. Rohwer.

LEPTACINUS *Erichs.*

L. LEIDYI *Scudd.* One fine specimen, without citation of station or collector.

TACHINUS *Grav.*

T. SOMMATUS *Scudd.* Station number 14. One specimen. Station number 17. One specimen, collected by Mrs. W. P. Cockerell.

TACHYPORUS *Grav.*

T. NIGRIPENNIS *Scudd.* Station number 17. One specimen, collected by Mrs. W. P. Cockerell.

BOLETOBIUS *Leach.*

B. FUNDITUS *Scudd.* Station number 17. One specimen, collected by Mrs. W. P. Cockerell.

MYCETOPORUS *Mann.*

M. DEMERSUS *Scudd.* Station number 14. One specimen, collected by Mrs. W. P. Cockerell.

BLEDIUS *Leach.*

B. OSBORNI *Scudd.* Station number 14. One specimen, collected by Mrs. W. P. Cockerell.

DELEASTER *Erichs.*

D. GRANDICEPS n. sp. (Plate I, Fig. 3.) Form similar to that of the recent Colorado species, *D. trimaculatus.* Head larger than the prothorax, eyes prominent, antennæ incrassate distally but with the joints not distinct. Prothorax distorted, narrower than the head and somewhat constricted in front of the base which is subequal to the apex, the sides protuberant. Elytra much broader at base than the prothorax, each apparently with a large rounded light spot in front of the middle. The entire upper surface is simply finely scabrous, but traces of punctures show that a better preserved specimen might indicate another type of sculpture. Length of fragment, 7.25 mm.

Station number 14. A single specimen, collected by Geo. N. Rohwer. The type is in the Museum of the University of Colorado.

This was a larger species than the one with which is has been compared and was probably not strictly congeneric, though of the same general type. In *D. trimaculatus* the elytra are darker at the apex and in the scutellar region, but have no well defined light spots.

ADALIA *Muls.*

A. SUBVERSA *Scudd.* A specimen sent directly from Professor Cockerell is referred here. It is of the same size and form as Dr. Scudder's example and of a similar light color, preserved in dorsal view, and shows the insect to have been a member of the group Coccinellæ to which *Adalia* belongs. The coxal lines of the first ventral are well exhibited. The antenna is moderately long and gradually clavate as in the recent *A. bipunctata.* Since Dr. Scudder made his identification practically upon facies alone, it is interesting to have it verified by the discovery of this better specimen.

Station number 14. Collector not specified.

TRITOMA *Fabr.*

T. SUBMERSA n. sp. (Plate III, Figs. 2, 3.) Form rather short for this genus. Head large, broader than long, eyes not discernible in their entire outline, but enough shows to indicate that they were of good size. Antennæ mutilated but fragments of both remain, showing the basal joints to have been slender and the club to be composed of three broad joints, similar among themselves. Prothoracic width equal to double the median length, hind angles a little rounded, anterior angles a little acute, sides margined. The greatest width is slightly in front of the base, whence the sides taper with slight arcuation to the apex. Scutellum small but distinct, triangular. Elytra two and two-thirds times the length of the prothoracic median line, conjointly noticeably broader than the prothorax, pointed at the apex, exterior and sutural margins with a rather fine bead. Legs wanting. No distinct sculpture can be made out on the specimen, but the elytra show faint signs of striæ. Length, 2.50 mm.

Station number 14. One specimen, collector not specified. The type is in the Museum of the University of Colorado.

Though rather small for this genus, the specimen seems to belong to the Erotylidæ and appears more closely allied to *Tritoma* than to any other genus that I know. At any rate there is no basis for generic separation.

T. MATERNA n. sp. (Plate II, Figs. 7, 8.) Form rather short, resembling that of the recent *T. humeralis*. Head comparatively a little larger than that of the species cited, the sculpture, (except a few scattered fine punctures), eye and articulations of the antennæ effaced. Prothorax short, not much arched in profile. Elytra cuneiform in side view, about three and one-half times as long as the prothorax and a little more than twice as long as high. Legs short, tibiæ expanded towards the tips and flattened. Length, 4.85 mm.; of elytron, 3.55 mm.

Station number 14. One fine paired specimen, collected by S. A. Rohwer. The type is in the Museum of the University of Colorado.

This beetle is strikingly like the recent *T. humeralis* in outline and has the same leg construction as far as can be seen, except that the hind tarsi are perhaps a trifle longer in proportion to their tibiæ in the fossil. The sculpture seems to have been finer, the prothorax with very sparse punctuation, the elytra with rows of fine distant punctures.

PHLŒONEMITES n. gen.

This name is proposed for a fossil similar to the recent *Phlœonemus catenulatus* in form, size and elytral sculpture, but differing in having the

antennal club much more gradually formed and the prothorax without sharp raised lines. The type and only known species is *P. miocenus,* described below.

P. MIOCENUS n. sp. (Plate II, Figs. 9, 10, 11.) Form somewhat obscured through the breaking of the margins, but not much more elongate than that of *Phlœonemus catenulatus.* Head narrower than the prothorax, shape destroyed through the obliteration of the margin, vertex strongly and closely punctured. Eyes indistinguishable. Antennæ showing only fragmentary portions, the club of one is intact and is formed of two joints, the three preceding joints successively narrower as the head is approached. Prothorax with the sides damaged, upper surface strongly sculptured with close set circular punctures. Elytra a little over three times as long as the prothorax and conjointly about two-thirds as wide as long, broadest about the middle, not strongly tapering in either direction but becoming somewhat suddenly conjointly rounded at the apex. Sculpture composed of a sutural and submarginal and three deep, smooth, discal grooves, between which are double series of elongate punctures, the punctures of each row separated by a transverse raised line, the lines and punctures of each row of a double series alternating with those of its fellows, as shown in the detail drawing. Length, 4.25 mm.

Station number 13. One specimen, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

The specimen is one received directly from Professor Cockerell, and I believe it is undoubtedly a reverse, in which case the head and thorax are granulate (a common structure in the Colydiidæ), the elytra with submarginal, sutural and three discal costæ, each elytron with four double series of elongate tubercles as in *Phlœonemus catenulatus.* The club of the antenna is so gradually formed that it might about as well be called three jointed as two jointed.

DERMESTES *Linn.*

D. TERTIARIUS n. sp. (Plate V, Figs. 1, 2.) Form moderately elongate. Head wanting. Prothorax crushed, but the remains show it to have been broader at base than at apex, the base slightly prominent at middle but not lobed, the apex weakly arcuately emarginate. Elytra not striate, subparallel to behind the middle, thence tapering to the apices which are bluntly pointed. Abdominal segments subequal, except the first which is longer. The entire surface of the prothorax and elytra is finely, regularly, and rather closely punctured, the punctures bearing moderately long hairs. Length, from front of pronotum to apex of abdomen, 7.50 mm.

Station number 14. One paired specimen collected by Mrs. W. P. Cockerell. The type is in the American Museum of Natural History.

In the absence of head and legs, the generic assignment is open to some doubt, but what can be seen of the form, sculpture, and vestiture points to the above reference. This insect is much larger than *Attagenus sopitus* Scudd., the only Dermestide thus far known from the Florissant shales.

Orphilus *Erichs.*

O. DUBIUS n. sp. (Plate I, Fig. 7.) Similar in form to the recent *O. ater*, and of about the same size. The sculpture is either much finer or else poorly preserved, and the surface of the prothorax and elytra is nearly smooth. The head is not visible, presumably covered by the front margin of the prothorax. Length, 3.00 mm. Width, 2.05 mm.

Stations number 14 and 14B. Two specimens, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado, the cotype in the American Museum of Natural History.

The reference is based on the form and size of the specimen, and must be considered provisional. The appearance is entirely that of *Orphilus*, with the punctuation slightly developed.

Amartus *Lec.*

A. PETREFACTUS n. sp. (Plate II, Figs. 12, 13.) Form a little more elongate than in the recent *A. rufipes* and *A. tinctus*. Head, exclusive of the mandibles, as long as the prothorax but much less broad. Eyes not definable. Antennæ eleven jointed, first joint large and thick, third long, club gradually formed as usual in the tribe Brachypterini. Prothorax distorted but evidently narrowed anteriorly and with rounded sides, about two and two-fifths times as broad as long. Elytra showing only along one edge, not displaying any characters of interest. Abdomen somewhat displaced but showing that the segments near the base are short. Length, 3.85 mm.

Station number 14. One specimen, collector not specified, which is considered the type and is in the Museum of the University of Colorado. Another example, referred here with little doubt, comes from Station number 17 and was collected by Mrs. Cockerell.

This insect goes very well with *Amartus*, which genus is now represented on our Pacific coast. The formation of the antennal club does not permit of its reference to the Carpophilini, to which it has a superficial resemblance. About the only structural character of importance that can be made out on the underside is the shape of the front coxæ which are shown to be transverse and narrowly separated by the prosternum.

NOSOTETOCUS *Scudd.*

N. VESPERTINUS *Scudd.* Station number 14. One specimen, collected by S. A. Rohwer. This shows the upper surface and indicates that the elytra were punctured in rows as suspected by Dr. Scudder.

DRYOPS *Oliv.*

D. TENUIOR n. sp. (Plate III, Fig. 4.) Resembles *D. eruptus* from the Florissant shales but is smaller and more slender. Head with microscopic scattered punctuation. Eye small. Prothorax nearly straight in front, sinuate behind, rather broader proportionately than in the recent *D. lithophilus*, front angle produced beneath and partly covering the eye as in that species, surface finely, microscopically, sparsely punctured, a little more coarsely than the head. Scutellum small. Elytra mutilated at the tip, sides subparallel, surface marked with rows of indistinct moderate-sized elongate punctures. Legs long, claw-joints swollen. Length, 4.15 mm.

Station number 14. One paired specimen, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

This seems to be a good *Dryops* by all the visible characters and in any event is closely related to that genus. The sketch shows the outline and the courses of the elytral rows of punctures as far as they can readily be distinguished.

LUTROCHITES n. gen.

This name is proposed for a fossil insect of nearly the shape and size of the recent *Lutrochus luteus* and of a similar velutine appearance. It differs in the strongly longitudinally striate head and somewhat in the punctuation as well. It is impossible to be sure of the family affinities, but I have placed it here provisionally. The type is *L. lecontei*, described below.

L. LECONTEI n. sp. (Plate V, Fig. 4.) Form short and broad. Head with the outline somewhat broken and the exterior margins of the eyes damaged, but these organs were large. The vertex has about thirteen strong and nearly equidistant longitudinal striæ. Prothorax distinctly broader than long, widest at base, sides more or less arcuate to the apex, surface distinctly punctured, the punctures well separated but not distant, a little stronger near the sides. Elytra about two and two-thirds times as long as the median prothoracic line, sides subparallel anteriorly, posteriorly arcuately narrowing to the apices which, separately, are acute, conjointly they were perhaps sharply rounding. The elytral sculpture consists of a fine, confused punctuation, but, like the whole upper surface of the body, the wing covers have a velutine appearance. Length, 2.65 mm. Width, 1.75 mm.

Station number 14. One specimen, collected by Mrs. W. P. Cockerell. The type is in the American Museum of Natural History.

This species has been very troublesome to place. It seems best assigned in the position here given and if it should occur again in collections from these shales will readily be known by the peculiar sculpture.

ANTHAXIA *Esch.*

A. EXHUMATA *Wickh.* Station number 14. A paired specimen in rather poor condition and a little smaller than my type was collected by Geo. N. Rohwer.

MELANOPHILA *Esch.*

M. COCKERELLÆ n. sp. (Plate III, Fig. 5.) Form only moderately elongate, subparallel at sides. Head much broader than long, reticulately sculptured, similarly to the prothorax but a little more finely. Prothorax damaged in front but about one and three-quarters times as broad as long, the apparently undamaged side straight, surface reticulate as in the recent *M. consputa, M. intrusa* or *M. æneola.* Elytra apparently finely scabrously punctate not pointed nor truncate but moderately conjointly rounded at the apex. Legs wanting. Length from front of head to abdominal apex, 10.70 mm.; of elytra, 5.85 mm. Width across middle of elytra, 3.90 mm.

Station number 14. Two specimens. the collector of the type not specified, of the co-type, Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado, the co-type in the American Museum of Natural History.

This insect resembles (by description) none of the known Florissant Buprestidæ. It is much larger than *Anthaxia exhumata* and much smaller than *Chrysobothris haydeni.* While of about the same size as *C. gahani,* that species must be very differently proportioned, since Professor Cockerell gives the length of the elytra as about 8.00 mm., as against 5.85 mm. in the present insect. Compared with recent forms, it was probably most like *M. intrusa* in general appearance. The generic reference is based on the size, form and sculpture, all of which are matched in recent species of *Melanophila* in my collection. The cotype is slightly smaller than the type, but otherwise does not differ. It shows the large eye with straight inner border common to recent Melanophilæ and particularly noticeable in *M. acuminata* and *M. atropurpurea.*

M. HANDLIRSCHI n. sp. (Plate III, Fig. 6.) Form elongate, subparallel, but broadest behind the middle of the elytra. Head long, surface

extremely closely and quite finely punctured, the punctures crowded so much as to have lost, in great part, their circular outline. Eyes moderate in size, long, inner edges straight. Prothorax broader than the head, the posterior edge indistinguishable so that no comparisons can be made with the length, surface reticulately sculptured about as in *M. cockerellæ*. Elytra long, tapering strongly from behind the middle to the apices which are obliquely truncate from the suture and sharply acuminate, sculpture a rather fine confused punctuation tending to form transverse rugosities as in *M. fulvoguttata*. Front and middle femora and middle tibia rather slender, remainder of legs wanting. Length, from front of head to elytral apices, 14.25 mm.; of elytron, 9.25 mm. Greatest width across both elytra in position as preserved, 5.50 mm.

Station number 13B. One fine paired specimen, collected by S. A. Rohwer. The type is in the American Museum of Natural History.

This seems to be a good *Melanophila*. It is so different in the form of the body and of the elytral apices as to separate at sight from *M. cockerellæ*. The size will distinguish it from all the other known Florissant Buprestidæ except *Chrysobothris haydeni*, which is described by Scudder as having rounded eyes and broad-tipped, impunctate elytra.

I name this species for Dr. Anton Handlirsch of Vienna, Austria.

ACMÆODERA *Esch.*

A. SCHAEFFERI n. sp. (Plate III, Fig. 7.) Form moderately elongate. Head not distinctly separable from the prothorax, the latter broadest near the base, finely scabrous and hairy. Elytron strongly sinuate externally and sharply pointed at the tip, surface scabrous and hairy, apparently a little more coarsely than the prothorax. Legs wanting. Length, from front of head to elytral apex, 8.00 mm.; of elytron, 5.90 mm. Width of elytron at the postmedian bulge, 1.30 mm.

Station number 14. One specimen, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

This is well preserved as to the left elytron and has the characteristic look of an *Acmæodera*. It differs from all of our species with which I am acquainted in the finer sculpture and the lack of serrations near the elytral apex. It may be that this species and *A. abyssa* are congeneric but not strictly referable to the genus in which I have placed them.

The beetle is named after Chas. Schaeffer, of the Museum of the Brooklyn Institute.

A. ABYSSA n. sp. (Plate IV, Fig. 2.) Form rather stout. Head and prothorax not showing any details of sculpture other than a fine scabrosity. But one elytron remains entire, which is strongly sinuate externally and blunt at the tip, the surface scabrous, probably from the sculpture showing through. Legs wanting. Length, from front of head to tip of abdomen, 7.75 mm.; of elytron, 5.50 mm. Width of elytron at postmedian bulge, 1.25 mm.

Station number 17. One specimen, collector not specified. The type is in the Museum of the University of Colorado.

The specimen lies on its back, so as to present a ventral view. It differs from *A. schaefferi* in the shape of the elytron and in the generally stouter form, and I think is undoubtedly distinct. The front of the prosternum shows at the middle and is rather faintly arcuately prominent. On account of distortion, I have not attempted to describe the thoracic outline.

PYROPYGA *Motsch.*

P. PRIMA n. sp. (Plate V, Fig. 3.) Form about like that of the recent *P. decipiens*, the prothorax covering the head in a similar manner but the upper cephalic outline shows through the expanded front margin of the pronotum. Antennæ and eyes not definable, elytra about two and one-half times the length of the prothorax. Sculpture of entire upper surface obscure. Abdomen banded as shown in the figure. Length, from front margin of prothorax to the abdominal tip, 5.60 mm.; of elytra, 3.60 mm.

Station number 14. One specimen, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

This looks like the recent species of *Pyropyga* and I have no doubt that it belongs in the near vicinity of the genus.

EUDASYTITES n. gen.

This name is proposed to accommodate a species belonging to the Malachidæ and probably to the tribe Dasytini. Lacking antennæ and legs, a closer determination cannot be made at present. The genus may be considered a magazine for the reception of the type, *E. listriformis*, described below, and such other fossil forms of the same general nature as show affinities too obscure to be made out with certainty. It should be made up of fossil Dasytini of a slender build and coarse sculpture, with vestiture inconspicuous or wanting.

E. LISTRIFORMIS n. sp. (Plate II, Fig. 14.) Form elongate, probably subparallel in life but by pressure the elytra are spread and the abdomen is distended. Head small, rather narrow. Antennæ wanting. Eyes not definable. Prothorax nearly twice as wide as long, somewhat distorted so

that one side is about straight while the other is arcuate. Elytra broken at tip but showing a good part of their surface which is strongly sculptured with moderately large subconfluent punctures tending to form transverse rugæ. Abdomen with six visible segments, nearly smooth, sternal thoracic pieces finely and sparsely punctured, a little more coarsely and closely on the prothoracic flanks. Length, 3.50 mm.

Station number 14. One specimen, collected by S. A. Rohwer. The type is in the American Museum of Natural History.

There seems to be no reason for doubt as to the family affinities of this beetle, but students of the Malachidæ will know the difficulty of closer classification in the absence of all appendages.

TRICHOCHROUS *Motsch.*

T. MIOCENUS n. sp. (Plate V, Fig. 5.) Form rather elongate. Head and prothorax much distorted and with the sculpture obliterated. Elytra covered somewhat sparsely with slender short hairs and with well defined regular series of longer stouter hairs, which, in their prostrate fossil condition, give the appearance of striation, as shown in the figure. Length, 5.00 mm. Width, 2.65 mm.

Station number 17. One specimen, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

The vestiture of this beetle is arranged about as in the recent *T. seriellus*, common in Wyoming and Utah.

PROTAPATE n. gen.

Related to *Apatides* Casey, but differs in the eyes being relatively much larger when viewed from above, the intervening separating space being only about equal to the transverse ocular diameter. Prothorax apparently without recurved hooked processes and differently sculptured, as will be seen from the following description of the typical and only known species.

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P. CONTORTA n. sp. (Plate II, Fig. 15.) Preserved in dorsal view, the elytra somewhat twisted and partially overlapping, the prothorax also distorted. The specimen is a reverse, but I describe the markings as shown thereon, adding the interpretation at the close of the diagnosis. Head transversely quadrate, eyes transversely elliptical, relatively large, separated by about one long diameter. Front finely granulate, vertex finely longitudinally rugose for its entire width. Prothorax distorted, but longer than high (or broad, it is not possible to tell from the condition of the specimen whether we see the entire disk, but I believe it is in part profile), closely, strongly, and rather regularly granulate, the granules rounded, replaced on an area occupying the anterior dorsal portion by a considerable group of deep, large punctures disposed in about five diagonal series.

Elytra obtuse at tip, other details of outline not definable, ornamented with granules similar to those of the prothorax, arranged in about fifteen fairly well-defined series, which, however, become confused near the apex. These granules are separated in the series by much less than their own diameters, but the interserial spaces are a little wider as a rule. Femora moderate, the remaining parts of the legs wanting. Length, 14.50 mm.; of head, 2.25 mm.; of prothorax, near upper margin, 4.75 mm.; of elytron, 8.35 mm. Width of head, 3.25 mm.; of flattened elytron, near middle, 3.50 mm. Height of prothorax, 3.75 mm.

Florissant, Colorado, collected by Mrs. C. Hill. The holotype is in the Peabody Museum of Yale University.

Since the specimen is a reverse, the granules, of course, represent punctures, and vice versa. We have indicated, then, an insect of about the size of the recent *Apatides fortis* Lec., the anterior margin of the prothorax similarly strongly, sharply asperate, the head rugose in like manner and the elytra deeply, strongly, seriately punctured in the same way, the little mammillæ seen at the bottom of some of these punctures being represented in the fossil by small pits at the apices of the granules. But in *P. contorta* the principal discal prothoracic area, with most of the sides and posterior portions, are strongly punctate instead of being granulate or asperate, reproducing on a larger scale and with some difference of detail the sculpture of those parts in *Micrapate dinoderoides*. What little can be seen of the legs, agrees with the corresponding structures in *A. fortis*. While the generic characters set forth are not in themselves of any great importance, it is probable that the insect was not a true *Apatides*, and it has seemed better to separate it.

XYLOBIOPS *Casey*.

X. LACUSTRE n. sp. (Plate V, Fig. 6.) Form moderately elongate. Head long, eyes and antennæ not definable. Prothorax projecting over the head, the front margin somewhat produced, surface roughened, anterior declivity with about four transverse rows of asperities. Elytra declivous and pointed at apex, a moderate sized sharp tooth near the top of the declivity, disk punctate with close rows of circular somewhat approximate punctures. Legs wanting. Length from front of prothoracic margin to elytral tip, 5.35 mm.

Station number 14. One specimen, collected by S. A. Rohwer. The type is in the American Museum of Natural History.

There seems no reason to doubt that this insect is properly

placed, although the prothoracic margin is a little more produced anteriorly and the transverse rows of asperities are more regular than in our recent species of *Xylobiops*. In the characters noted, our insect comes nearer to *Dinoderus*, and this would be the alternate reference. It looks like a *Dinoderus* with the elytra of a *Xylobiops*. The genera are fairly closely related.

ATÆNIUS *Harold.*

A. PATESCENS *Scudd.* (Plate VI, Figs. 4, 5.) A specimen of an Aphodiide agreeing with this species in size and what can be seen of the sculpture, exhibits the tarsal and tibial structures of the middle and hind legs very well. The opportunity of figuring the distal parts of these legs seems worth improving and drawings to show the tibial spurs and the proportions of the tarsal joints are offered herewith.

APHODIUS *Illiger.*

A. ABORIGINALIS n. sp. (Plate VI, Fig. 1.) Form stout, somewhat as in the recent *A. fimetarius* but probably a little shorter. Head and prothorax distorted, practically impunctate but the head is granulate or scabrous on the clypeal region. Scutellum short. Elytra with moderately strong and rather wide striæ which are fairly distinctly and closely but not strongly punctate. Length to tip of elytra which are broken at the apices, 5.75 mm.; when complete, probably 6.50 mm.

Station number 17. One paired specimen, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

This is readily known from all the other Florissant species, except *A. laminicola* which is nearly half as large again, by its greater size and wider striæ, in conjunction with the almost complete lack of cephalic and thoracic sculpture.

A. RESTRUCTUS n. sp. (Plate VI, Fig. 2.) Form similar to that of the recent *A. granarius*, as far as can be determined in the condition of the specimen. Clypeus damaged anteriorly so that the shape of the front margin is not determinable with certainty, the surface with shallow punctures but probably not rugose. Top of head with a few scattered small punctures. Prothorax narrowed anteriorly but the sides are too much distorted to describe, the disk very sparsely and finely punctured along the middle, somewhat more closely and coarsely towards the sides but without any tendency to a transverse arrangement. Scutellum short. Elytra finely, sharply, and not very deeply striate, the striæ impunctate. Length, 3.50 mm.

Station number and collector are not cited, but the specimen was taken

by one of the parties under the direction of Professor Cockerell. The type is in the Museum of the University of Colorado.

This is smaller than *Atœnius patescens* and has a different punctuation. The simple elytral striæ, with the size, will separate it immediately from *Aphodius florissantensis* and the impunctate elytra will differentiate it from *A. granarioides.* I have placed with the type, a second specimen collected at Station 17B by Mrs. W. P. Cockerell.

A. SHOSHONIS n. sp. (Plate VI, Fig. 3.) Form stout, nearly parallel sided. Head short, clypeus broadly rounded anteriorly, without emargination. Prothorax about one and three-fifths times as broad as long, sides subparallel from the base to beyond the middle, thence arcuate to the apex. Front angles obtuse but well defined, hind angles obtuse and not prominent. Scutellum moderate. Elytra, separately, nearly twice as long as wide, with strong, fine, sharp striæ, which seem to be impunctate. Legs not in very good preservation, the armature of the front tibiæ being indefinite and all the spurs gone except those of the hind leg which seem to be slender and equal. The hind tibia and tarsus are fairly well shown and are quite slender. Length, 2.95 mm.

Station number 17. Collector not specified, but the insect was secured by one of the parties under direction of Professor Cockerell. The type is in the Museum of the University of Colorado.

I place this insect in *Aphodius* and feel sure that it belongs in that genus in its broad sense at any rate. The clypeus is of a type uncommon in *Aphodius* proper, but resembles that of some species of *Ægialia.* The legs, however, seem too slender to permit of association with this latter genus. I have not attempted to describe the sculpture of the head and prothorax, since the specimen is too thoroughly carbonized to permit this character to be made out.

A. LAMINICOLA *Wickh.* Station number 14. A good specimen was collected here by Mrs. W. P. Cockerell. It offers no characters additional to those given elsewhere.

SERICA *Mac Leay.*

S. ANTEDILUVIANA n. sp. (Plate VI, Fig. 6.) Form, viewed in profile, only moderately stout for this genus. Head fairly large. Prothorax short, about one and a half times as high as long, no definite sculpture visible on either of these parts. Elytra nearly smooth but with some evidence of the presence of shallow striæ. Abdomen finely alutaceous. Legs stout, fore

tibia with three well marked teeth, the upper one the weakest. Hind tarsi long. Length, 6.10 mm.

Station number 14. One paired specimen collected by Mrs. W. P. Cockerell; another single example from the same source is referred here with some doubt. The type is in the Museum of the University of Colorado.

The above short description sets forth the principal characters, as far as they can be made out, of a beetle which I think may be well placed with *Serica*. However, all of our native species of *Serica*, so far as I know them, have but two teeth on the fore tibiæ; the fossil agrees more closely with the allied genus *Diazus* in having three. The body form is more like that of *Serica*, and I prefer to so place the specimen. The present species is smaller than the average in the genus, but is of almost exactly the same size as the recent *S. trociformis*, and is also closely approximated in this respect by a new form in my collection, from Buena Vista, Colorado.

Macrodactylus *Latr.*

M. pluto n. sp. (Plate VI, Figs. 7, 8.) Preserved in dorsal view and showing parts of the middle and hind legs, the front legs and antennæ lacking. Head, across the eyes, a little broader than long, closely and roughly punctured over nearly the entire surface, the vertex more finely, a narrow occipital space about smooth, clypeus truncate and barely emarginate in front. Prothorax more finely and sparsely punctate than the head, narrowed at base and apex, strongly angulate about the middle. Elytra broader in front of the middle, not covering the tip of the abdomen, with faint indications of longitudinal striæ and apparently finely punctured as well. Tibiæ (middle and hind) about straight, broader at tip, posterior tarsi long, the first joint about twice the length of the tibial spurs. Length, total, about 12 mm.; of head, 2.00 mm.; of prothorax, 2.85 mm.; of elytron, 6.75 mm.; of hind tibia, 3.00 mm.; of hind tarsus, about 4.50 mm. Width of head, 2.65 mm.; of prothorax, 4.10 mm.; of one elytron, 2.85 mm.

Station number 13. One specimen, with reverse, collected by Walter Reed, while a member of the expedition to Florissant, under the leadership of Professor Cockerell, in March, 1911. The type is in the Museum of the University of Colorado.

The generic reference is made on the strength of the shape of the prothorax, the sculpture of the head and body, the small eyes, and the long tarsi. In the broad pronotum, this specimen resembles some of the Mexican species, but this part must undoubtedly have been flattened and spread out by pressure. A shred of

some foreign matter lying along the end of the right hind tibia bears a deceptive resemblance to an extremely elongate spur, but I believe the structure to be properly described above. Additional specimens of the insect have since been found in the collection of the United States National Museum, one of them displaying the left antenna. This organ is figured, and will be seen to differ in no important respect from the recent forms, as far as can be made out from the rather indistinctly shown articulations. This is the only fossil Scarabæid thus far known to me in which the antenna can be seen.

M. PROPHETICUS n. sp. Form generally similar to that of *M. pluto*, but a little more elongate. It is a considerably larger species with a relatively smaller prothorax, widest about the middle, sides not at all angulate but curving almost regularly to the apex and base which are subequal. The elytra can barely be made out through the overlying abdomen (the specimen being preserved in ventral view) which they do not cover, nearly the whole of two segments being exposed beyond their apices. Middle and hind legs spiny or with stout hairs. Length, 18.35 mm.; of head, 1.35 mm.; of prothorax, 3.40 mm.; of hind femur, about 4.35 mm.; of hind tibia, the same; of hind tarsus including the claws, 6.75 mm. Width of prothorax, 4.75 mm.; across elytra, about 7.25 mm.

Station number 14. Collector not specified. The type specimen comes directly from Professor Cockerell, with the collection number 168, and is in the Museum of the University of Colorado.

I see no reason for doubting that this is congeneric with *M. pluto*, which it sufficiently resembles to obviate the need of a figure. The two species differ in size and in the shape of the prothorax. The sculpture does not show in *M. propheticus*, but it was probably fine or it would be likely to leave some imprint on the stone.

DIPLOTAXIS *Kirby*.

D.(?) SIMPLICIPES n. sp. (Plate VI, Fig. 9.) Form moderately robust. Head short, anterior outline nearly semicircular. Eye small. Prothorax about twice as broad as long (measured along the median line) sides strongly and regularly arcuate. Elytra about three and three-fourths times as long as the prothorax (the latter measured as before) with the striæ of fine but not at all closely placed punctures, these striæ becoming confluent towards the apex as shown in the figure. Legs short, the front one, as drawn, not entirely free from the matrix so as to appear smaller than it really is, the middle and hind tibiæ roughened about as in *Diplotaxis*, but not ridged. Length, about 10.25 mm.; of elytron, 7.25 mm.; of middle

tibia, 1.75 mm.; of middle femur, 1.80 mm. Width of prothorax about 3.70 mm.

Station number 13B. One specimen, received directly from Professor Cockerell. The type is in the Museum of the University of Colorado.

The specimen shows the underside, as far as the trunk is concerned, but the elytron is twisted so as to exhibit the upper surface. In the drawing, the punctures are a little too close together, but answer the purpose intended, in showing the courses of the striæ.

D. AURORA *Wickh.* Station number 13. One paired specimen of a wing cover in rather imperfect condition, was collected by Professor Cockerell. A prothorax, with the front legs still attached, was taken at Station 17 by Geo. N. Rohwer, and may represent the same species.

LEPTURA *Serv.*

L. PETRORUM n. sp. (Plate VIII, Fig. 2.) Form rather elongate but the outlines of the body are partly obscured by the spread wings. Head long, muzzle produced, eyes not defined, sculpture obliterated. Antennæ long and slender, the apices wanting but in their completeness they must have reached nearly to the elytral tips. Prothorax, in side view, strongly tapering to the apex, arched above and below, the sculpture indistinct but there is some evidence of irregular punctuation. Elytron very strongly tapering to the tip, which is excavate and pointed on one side. Legs moderately slender. Length from front of head to elytral apex, 11.85 mm.; of elytron, 9.65 mm. Height of prothorax at base, 3.00 mm.

Station number 14. One specimen collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

The generic reference is to be understood in the broad sense, since the recent genera of Lepturæ separate upon characters which would only exceptionally be visible in fossils. The present species is easily separable from *L. ponderosissima* by its different build and from *L. antecurrens* by having much longer antennæ and sharp elytral tips. I have given the two names last mentioned to Florissant fossils belonging to the collection of the United States National Museum, and while they will presumably appear in print shortly they are as yet unpublished.

DONACIA *Fabr.*

D. PRIMÆVA n. sp. (Plate IV, Fig. 3.) Form rather slender. Head wanting. Prothorax crushed and distorted, the visible sculpture consisting of feathery or dendritic lines which I believe to be adventitious. Elytra

tapering and not truncate at tip, marked with moderate sized punctures in striæ, the striæ showing evidences of extensive confluence at their tips, as in recent Donaciæ. Scutellar stria strong and moderately long. The strial punctures are finer towards the elytral apices, distinctly but not strongly elongate and separated in each stria by spaces about equal to their own long diameters. In some parts they are a little closer together. Legs of moderate length, the fore and hind femora (the middle ones being wanting) moderately swollen but without signs of dentation, front tarsus not palmate. Length of fragment, from apex of prothorax to that of the elytra 8.00 mm.; of elytron, 6.30 mm.

Station number 14. One paired specimen, collected by S. A. Rohwer. The type is in the American Museum of Natural History.

My idea of this *Donacia* is that it was of the general type of the recent *D. emarginata,* that is to say a form of moderate specialization as compared with the broad, flat, long-legged *proxima* on one side and the convex, short-legged *rufa* on the other. I think there can be no doubt as to the correctness of the generic reference. The front femur, described above, shows on only one stone and is not figured in the drawing which is made from the other slab.

CRIOCERIDEA n. gen.

This name is proposed for a Chrysomelid of doubtful affinities, apparently related in build to *Crioceris,* but differing in several points, especially in the finer sculpture and in the longer second antennal joint. It differs from *Lema* in the same features and also in having a distinct scutellar stria, sharing this last character with *Crioceris.*

C. DUBIA n. sp. (Plate V, Figs. 7, 8.) Form hardly elongate. Head a little shorter than the prothorax and without visible sculpture. Eye large, circular. Antennæ rather elongate, the two of apparently different thickness, probably on account of one showing on the flat, the other on the edge. In the wider one the breadth is about as in the recent *Crioceris asparagi* (or a little less) the joints beyond the middle are shortened in the same way. Prothorax distinctly broader than long, not sculptured. Elytra a little more than three times the length of the prothoracic median line, conjointly much wider than the prothorax, apices rounded, sculpture of lines of fine, well-separated punctures which fade out posteriorly except at the sides. The courses of some of these lines are indicated on the figure, but as the markings are not preserved over the whole disk the drawing shows them in fragmentary condition. Legs wanting, except one belonging to the front or middle pair which is rather slender. Length to elytral tip, 5.50 mm.

Station number 17. One specimen, collected by Geo. N. Rohwer. The type is in the Museum of the University of Colorado.

This insect looks very much like *Lema evanescens* but is more finely punctured and has a distinct scutellar stria.

METACHROMA *Lec.*

M. FLORISSANTENSIS n. sp. (Plate V, Fig. 9.) Form moderately elongate, probably about as in the recent *M. californicum.* Head and prothorax very poorly preserved, not showing the sculpture nor fully maintaining the original shape. Antennæ long and slender, reaching to near the middle of the elytra. Elytra somewhat overlapping along the suture but not sufficiently to seriously obscure the punctuation which is rather fine and arranged in nearly regular striæ, fading towards the apex as in recent species of this genus. Length from front of prothorax, as preserved, to abdominal apex, 5.25 mm. In life, with the head normally extended, it probably reached a length of about 1 mm. more.

Station number 13B. One specimen, collector not specified. The type was received directly from Professor Cockerell and is in the Museum of the University of Colorado.

There is little doubt in my mind as to the correctness of the identification. The first stria, outside of the scutellar, has been partly obliterated by the overlap, otherwise the sculpture is strikingly like that of *M. californicum.*

BRUCHUS *Linn.*

B. HENSHAWI n. sp. (Plate VII, Figs. 1, 14.) Form moderately robust but less so than in *B. dormescens.* Head of normal size, finely and closely punctured, somewhat more coarsely on the front. Eye a little smaller than in most of the recent species with which I am acquainted. Antenna reaching about to the prothoracic hind angle, incrassate towards the tip but not strongly nor rapidly, the joints not serrate so that the outline is nearly even. Prothorax rather finely punctured, the punctures circular, larger than those of the head, rather distant except near the sides where they are considerably closer together. Hind angles rounded, median lobe not well marked. Elytra overlapping somewhat so that the exact shape is doubtful, but each seems to have been marked with nine striæ, the outer stria incurved at the humerus. The striæ are not deep but are strongly uniseriately punctate, the punctures rounded and rather closely approximate though not confluent, wider than the striæ, as shown in the detail figure, interspaces broad, flat, strongly and rather closely obliquely rugose. Abdomen poorly preserved, the sculpture not definable. Hind leg, the only one visible, showing a moderate post-median femoral tooth, tibia slightly curved and apparently carinate. Length, 4.15 mm.

Station number 14. A single specimen, collector not specified. The type is in the American Museum of Natural History.

Easily distinguished from all of the other known Florissant Bruchidæ, except *Bruchus dormescens,* by the form, and from that species by having simple antennæ, those of *B. dormescens* being strongly pectinate. In punctuation, it is different from any of the others. The specimen is in reverse, so that the punctures and striæ above described appear as granules and ridges.

Named for Dr. Samuel Henshaw of Cambridge, Massachusetts.

B. EXHUMATUS n. sp. (Plate VII, Figs. 2, 10.) Preserved as a reverse, in dorsal view, lacking the legs, front of the head and antennæ, but in good condition as concerns the elytral sculpture and structure. Eyes large, separated by less than their own width, emarginate anteriorly, the space between them apparently finely alutaceous but without well defined punctuation. Prothorax short, broader behind, the more perfect side about straight near the hind angle but broadly and regularly arcuate anteriorly, front margin slightly projecting at middle, hind margin with fairly well defined lobe, which, however, is split in the center so as to obscure the exact shape, the entire thoracic surface alutaceous like the head and in addition with low scattered granulations which represent shallow punctures. Elytra subparallel but broadest near the humeri, broadly separately rounded at apices, each with ten fine sharp subequidistant carinæ (representing striæ), these carinæ somewhat catenate as if the striæ had been marked with elongate but not very well defined punctures. The fourth and fifth striæ are shorter than the others, much as in the recent *B. discoideus,* which, however, was not resembled in form nor in general sculptural characters. Interspaces flat and finely alutaceous. Tip of abdomen wanting, probably owing to an imperfection in the stone. Length, from front of eyes to tip of elytra, 4.35 mm.; of prothorax, 1.10 mm.; of elytron, 2.90 mm. Width of prothorax, 1.50 mm.; of one elytron, behind humerus, 1.30 mm.

Florissant, Colorado, March, 1911, collected by Professor Cockerell. The type and only known specimen is in the Museum of the University of Colorado.

Aside from the characters given in the foregoing diagnosis, it may be noted that a pronotal carina on the fossil indicates that this part was marked with a distinct median groove in the living insect. The scutellum is not defined. In form, *B. exhumatus* probably approached the recent *B. protractus* Horn, from the southwestern states. It was a considerably smaller insect than Scudder's *Spermophagus vivificatus* from the Florissant shales, and if his figure is correct the elytra are differently striate. A specimen in the collection of the United States National Museum shows the antennæ nicely, and indicates that these organs were weakly serrate as in most of the recent North American species. This has furnished the basis for the figure given.

B. BOWDITCHI n. sp. (Plate VII, Figs. 6, 13.) Form elongate, similar to that of *B. exhumatus* from these shales. Head moderately large, sculpture indistinct but apparently of moderate sized circular closely placed shallow punctures. Eyes rather small. Antenna more slender than usual in this genus, the apical joints wanting, the median ones about equal in length and breadth, subserrate. Prothorax about three-fifths as long as wide, broadest behind the middle, tapering with nearly straight sides to the apex which is much narrower than the base, all the angles rounded or indistinct, surface with shallow but distinct close-set circular punctures which are more crowded at the sides, no sign of median groove or carina. Elytra long, about three times the length of the prothorax, finely striato-punctate, the punctures elliptical, moderately strong, wider than the striæ, those of each series separated by less than their own long diameters, as a rule, though in places they are more widely spaced. Both striæ and punctures are stronger near the elytral bases, becoming so weak near the apices that I have not been able to trace them with certainty in that region. Legs wanting. Length, about 6.00 mm.

Station number 17. One specimen collected by S. A. Rohwer. The type is in the Museum of the University of Colorado.

This is most like *B. exhumatus* but is distinguishable from it by the more slender antennæ and the stronger punctuation.

Named for Fred C. Bowditch of Brookline, Massachusetts.

B. FLORISSANTENSIS n. sp. (Plate VII, Fig. 3.) Form only moderately elongate, less so than in *B. bowditchi*, from which species it is separated chiefly by the body proportions. Head finely sculptured with small circular shallow closely placed punctures. Eye large. Antenna rather long and slender, similar to *B. bowditchi*. Prothorax with shallow but distinct small circular punctures (but considerably larger than those of the head) moderately closely placed on the disk, more crowded at the sides and much sparser on the prothoracic flanks. Elytra distinctly less than three times the length of the prothorax, surface with fine sharp striæ with elongate rather strong punctures separated in each series by a little less than their own long diameters. The striæ and punctures become weaker towards the tip, as in *B. bowditchi*, so that I have not attempted to figure their terminations. Hind femora large and swollen, tibiæ strongly arcuate. Length, 4.00 mm.

Station number 13. One paired specimen, in side view, collected by S. A. Rohwer. The type is in the Museum of the University of Colorado.

Resembles *B. bowditchi* very closely and I only separate it on account of the relatively much shorter elytra, although the punctuation, especially on the prothorax, is distinctly stronger. The femoral region is not sufficiently well defined to enable me to be sure of the absence of a tooth, but none can be made out.

I might have referred either this species or *B. bowditchi* to *Spermophagus vivificatus* Scudd., if it were not for the description of the antennæ in the last named species, where the joints beyond the fourth are said to be much longer than broad, and are so represented in the figure. In the two species of *Bruchus* the elytra are longer, in proportion to the prothorax, than in the figure of the *Spermophagus*.

B. SCUDDERI n. sp. (Plate VII, Figs. 7, 8, 11.) Form moderately elongate and more parallel than usual. Head mutilated, but showing signs of very shallow inconspicuous punctuation. Antenna exhibiting the seven proximal joints which are rather strongly serrate, the second joint shorter than the third, the fourth and fifth successively a little longer. The width of all the visible joints is nearly the same, and is about equal to the length of the fourth. The prothorax is distorted to such an extent that I do not care to describe the shape, but it seems to have had no distinct basal lobe and the apex is truncate. The punctuation (relatively to the other fossil Bruchids of Florissant) is strong and moderately coarse, the punctures circular and closely crowded or even occasionally subconfluent towards the sides, more widely spaced and finer along the middle, so as to give the effect of a nearly smooth median line when viewed under a low power. Elytra nearly three times as long as the prothorax, the striæ deep but narrow, with nearly rounded or slightly elongate punctures which are separated by about their transverse diameters. Under surface distinctly and rather strongly punctate over the entire thoracic region, the abdomen much more finely. Hind femur swollen but not visibly toothed, the tibia rather strongly curved and carinate, or possibly bicarinate. Length, 3.90 mm.

Station number 14. One paired specimen, collected by S. A. Rohwer. The type is in the Museum of the University of Colorado.

Easily recognized, among the Florissant forms, by the elongate elytra with strong, sharp, rather finely punctate striæ, the moderately strongly serrate antennæ, and the strong prothoracic punctuation.

It is named for the late Dr. Samuel Hubbard Scudder.

B. HAYWARDI n. sp. (Plate VII, Figs. 4, 5, 12.) Form only moderately elongate. Head weakly, finely and sparsely punctured, the punctuation visible only under high power. Eyes not definable. Antennæ long, the joints scarcely subserrate, those beyond the fourth distinctly longer than broad, the whole antenna very slender for the genus. Prothorax broad just in front of the base, sides narrowing rapidly to the apex which is truncate, basal lobe rather strong. Pronotal disk with small irregular scattered rather weak punctures, circular or slightly elongate, finer towards the sides, no evidence of median line. Elytra about two and a half times as long as the prothorax, tips rounded and not covering the abdomen, each with ten

fine, sharp, scarcely visibly punctate striæ, the punctures longitudinal. Middle coxæ closely approximate, hind coxæ more widely separated, intercoxal process triangular. Middle femur rather slender, hind femora strongly swollen but not visibly toothed, their tibiæ arcuate and carinate. Length, 4.65 mm.

Represented by three specimens, one paired and considered as the type from Station number 14, collected by Geo. N. Rohwer; one dorsal view (single) from Station number 17, collected by Mrs. Cockerell; and one single (side view) from the same source. The description and all the figures are made from the type, which is in the Museum of the University of Colorado.

It is easily distinguished from all of the other Florissant species of *Bruchus*, except *B. osborni*, by the slender antennæ and fine sculpture, and from that insect by the truncate thoracic apex, stronger punctuation and more pronounced basal lobe.

The species is named after the late Roland Hayward of Milton, Massachusetts.

B. OSBORNI n. sp. (Plate VII, Fig. 9.) Form moderately elongate. Head not visible, covered by the thorax. Antennæ long and slender, the joints beyond the second much longer than broad. Prothorax rounded at base and apex but without a strong basal lobe, surface with extremely fine and widely spaced punctures, which, however, are fairly deep. Scutellum rather large for this genus. Elytra about two and one-half times as long as the prothorax, finely, sharply striate, the strial punctures scarcely visible except at the base where they are very fine, slightly elongate and close together. The interspaces are flat and show a well marked longitudinal aciculation, probably due to the impress of a coating of hairs. Legs wanting. Length, from front of prothorax to the tip of the elytra, 4.45 mm.

Station number 17. Collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

Represented by a single specimen in beautiful condition as regards the characters of the upper surface. It is sufficiently differentiated from all of the other Florissant species by the shape and punctuation of the prothorax. The nearest ally seems to be *B. haywardi*, and the description of that insect should be consulted for additional differential features. The antennæ are represented as slightly too slender in the drawing.

Named for Dr. Henry Fairfield Osborn.

PLATYDEMA *Lap.*

P. ANTIQUORUM n. sp. (Plate IV, Fig. 4.) Form moderately robust. Head much narrower than the prothorax, distinctly broader than long.

Eyes transverse, moderate in size. Antennæ slightly incrassate towards the tips, eleven-jointed, first joint rather large, second small, third a little longer than the fourth, the remaining joints more distinctly broadened, forming the club. Prothorax arcuately emarginate anteriorly, basal margin sinuate, sides arcuately tapering to apex but somewhat imperfectly preserved. As near as can be judged from the condition of the specimen the pronotum was about two and one-fourth times as wide as long. Elytra about three times as long as the prothorax and rather broad, overlapping along the suture in the specimen so that their conjoint width is not properly shown. In places there are signs of striæ marked with rows of very fine punctures as shown in the figure. Legs wanting. Length, 8.00 mm. Width across both elytra, 4.35 mm.

Station number 17. One paired specimen, collector not specified. The type is in the Museum of the University of Colorado.

This insect must have been much like our recent *P. ruficorne* in build and probably had a similar but finer sculpture. The antennæ are comparatively somewhat broader at base in the fossil and the third joint is less distinctly elongate, but neither of these characters have more than specific value. The genus is well represented in the United States and Central America by species of varying form, size and color. One other, *P. bethunei*, is known from the Florissant shales, and is readily distinguished from *P. antiquorum* by being much larger and of more elongate form.

MORDELLISTENA *Costa*.

M. FLORISSANTENSIS n. sp. (Plate II, Fig. 16.) Preserved in profile. Head large. Prothorax as long as high, the dorsum slightly arched. Elytra two and a half times as long as the prothorax and nearly four times as long as wide, scarcely tapering to the tips which are blunt and rounded. Abdomen, as preserved, projecting far beyond the elytral apices, the extreme end pointed but without a distinct style. Length from front of head to apex of abdomen, 3.35 mm.

Station number 13. Collected by S. A. Rohwer. The type and only known specimen is in the Museum of the University of Colorado.

Easily distinguished from *Mordella lapidicola*, the only Florissant species of the family yet described, by the much smaller size of the present insect. I place it in *Mordellistena*, rather than in *Mordella*, partly because of its minuteness, since the tibiæ and tarsi are not well enough preserved for the exact demonstration of the oblique ridges characterizing the former genus, in case of their existence. There seems, however, to be two short ridges on

the face of the first joint of the hind tarsus. The entire body and the elytra show traces of fine hairs like those of recent species of Mordellidæ.

NEMOGNATHA *Illiger.*

N. EXSECTA n. sp. (Plate V, Fig. 10.) Preserved in part profile. Form rather slender. Head moderate in size, hind angles pronounced, but rounded, surface finely punctulate, eye of normal size, elliptical in outline, antennæ long, only the median or ultramedian joints preserved, these distinctly longer than wide. Maxillary processes longer than the head and prothorax together. Prothorax tapering a little anteriorly, the surface moderately coarsely cribrately punctured. Elytral punctuation shallow. Middle leg slender, the others wanting. Length, 7.00 mm.

Station number 14. One paired specimen, collected by Mrs. W. P. Cockerell. The type is in the Museum of the University of Colorado.

Only one Meloide, *Gnathium ætatis,* has thus far been described from the Florissant shales. It is a little smaller than *N. exsecta* and has the prothorax sculptured only with very faint transverse rugæ. The present species had a thoracic punctuation similar to that of our recent *N. vittigera* or *N. cribricollis.* In addition to the type, cited above, a second specimen, from Station number 13B, collected by Geo. N. Rohwer, has been met with in the material received directly from Professor Cockerell. This does not show the sculpture as well as the type, and exhibits only the bases of the maxillary processes, but is assigned here without much doubt.

DOCIRHYNCHUS *Scudd.*

D. IBIS n. sp. (Plate VIII, Fig. 1.) Form similar to that of *D. culex* from the Florissant shales. Head small and rather deeply sunken in the prothorax. Eye transversely elliptical. Genal and gular regions with about eight equidistant striæ visible in side view. Beak very long, a little curved, scarcely tapering and not dilated at the apex, a strong lateral stria or carina extending nearly the whole length. Antennæ not well enough preserved to show the jointing in sufficient detail for description, but they are inserted near the middle of the beak and have a slender, three jointed club. Neither the head nor beak show more than a very faint punctuation under the magnification of six or eight diameters. Prothorax about four-fifths as long as high, subtriangular in profile, dorsal line regularly and rather strongly arched, surface finely, sparsely punctured, and with a coarser transverse verrucose sculpture in addition. Elytra incomplete at apex, but more than twice as long as the prothorax, with longitudinal rows of

circular punctures, not very regularly spaced but those of each series are ordinarily separated by about their own diameters or less. Legs long, hairy, femora not toothed, the appearance of a denticle on the front femur being due to an imperfection of the margin. Tarsi short, the front joint of the hind ones nearly as long as the remaining three. Abdomen and thoracic sternites nearly smooth, pygidium exposed. Length from front of head to abdominal apex, 7.00 mm.; of beak, 6.75 mm.

Station number not specified. One specimen, collected by Geo. N. Rohwer. The type is in the Museum of the University of Colorado.

This insect forms part of a sending received directly from Professor Cockerell. It is undoubtedly a *Docirhynchus* and is nearest *D. culex,* but is about two-thirds as long again and has a rostrum of relatively greater length. It is like nothing else from the Florissant shales and is interesting as adding another species to the already large number of Rhynchitidæ from that region.

PACHYBARIS *Lec.*

P. RUDIS n. sp. (Plate II, Fig. 17.) Preserved as a reverse, in profile. Form short, stout, the dorsal outline more convex than in the recent *P. porosus.* Head with fine granules irregularly disposed above the eye but on the beak arranged in longitudinal series with rather distinct intervening carinæ. Eye distorted, squarish, in life probably nearly round. Antennæ wanting. Prothorax short, closely covered with rather large granules, some of which show a faint median indentation which may be the mark of a hair. Elytra displaying only a portion of the lateral disk, showing four sharply elevated narrow carinæ, broken by shallow notches into a series of elevations which are much longer than wide, the spaces between the carinæ not less than three times as wide as the ridges, their bottoms broken by rather distant transverse impressions into oblong spaces, but hair marks are not certainly visible. Underside of meso and metathorax granulate similarly to that of the prothorax, of abdomen much more sparsely so. Abdominal ventral surface ascending, the first and second segments long, the dividing suture indistinct, third and fourth short, subequal, fifth about equal to the two preceding, the sutures of these last three segments sharp and distinct. Legs wanting or obscured. Length, excluding beak, 3.45 mm. Height at middle, 2.20 mm.; the other body proportions may be approximated by reference to the figure.

Collected at Florissant by a party in charge of Professor Cockerell, in March, 1911. The type is in the Museum of the University of Colorado.

Remembering that the specimen is a reverse, we should have in life an insect of the form and size of *P. porosus,* with irregularly punctured head, the beak longitudinally striatopunctate in like manner, the prothorax, with the sides of the meso and meta-

thorax marked with large crowded punctures, the abdomen punctate somewhat more finely and sparsely. The elytral sculpture would consist of deep narrow striæ, each with a row of well marked longitudinally elongate punctures at bottom, the interstitial spaces much wider than the striæ and each with a row of large oblong punctures. It does not closely approximate any of the Barini described by Dr. Scudder, but seems to go well into the genus to which I have referred it since it shows so many of the features of *P. porosus.*

Explanation of Plates.

Plate I.

1. Amara cockerelli n. sp.
2. Quedius mortuus n. sp.
3. Deleaster grandiceps n. sp.
4. Miosilpha necrophiloides n. sp.
5. Miosilpha necrophiloides.
6. Miosilpha necrophiloides, detail of antenna.
7. Orphilus dubius n. sp.
8. Paussopsis secunda n. sp.
9. Paussopsis secunda, detail of antenna.

Plate II.

1. Cœlambus miocenus n. sp.
2. Cœlambus miocenus.
3. Cœlambus miocenus, antenna, in part.
4. Cœlambus miocenus, front tarsus, in part.
5. Cœlambus miocenus, middle tarsus, in part.
6. Cœlambus miocenus, hind tibia and tarsus.
7. Tritoma materna n. sp.
8. Tritoma materna, hind leg.
9. Phlœonemites miocenus n. sp.
10. Phlœonemites miocenus, apex of antenna.
11. Phlœonemites miocenus, elytral sculpture.
12. Amartus petrefactus n. sp.
13. Amartus petrefactus, antenna.
14. Eudasytites listriformis n. sp.
15. Protapate contorta n. sp. — 26163
16. Mordellistena florissantensis n. sp.
17. Pachybaris rudis n. sp.

Plate III.

1. Trechus fractus n. sp.
2. Tritoma submersa n. sp.
3. Tritoma submersa, apex of antenna.
4. Dryops tenuior n. sp.
5. Melanophila cockerellæ n. sp.
6. Melanophila handlirschi n. sp.
7. Acmæodera schaefferi n. sp.

Plate IV.

1. Agabus charon n. sp.
2. Acmæodera abyssa n. sp.
3. Donacia primæva n. sp.
4. Platydema antiquorum n. sp.

Plate V.

1. Dermestes tertiarius n. sp.
2. Dermestes tertiarius, detail of elytral vestiture.
3. Pyropyga prima n. sp.
4. Lutrochites lecontei n. sp.
5. Trichochrous miocenus n. sp.
6. Xylobiops lacustre n. sp.
7. Crioceridea dubia n. sp.
8. Crioceridea dubia, antenna, in part.
9. Metachroma florissantensis n. sp.
10. Nemognatha exsecta n. sp.

Plate VI.

1. Aphodius aboriginalis n. sp.
2. Aphodius restructus n. sp.
3. Aphodius shoshonis n. sp.
4. Atænius patescens *Scudd.*, middle leg.
5. Atænius patescens, hind leg.
6. Serica antediluviana n. sp.
7. Macrodactylus pluto n. sp.
8. Macrodactylus pluto, antenna.
9. Diplotaxis (?) simplicipes n. sp.

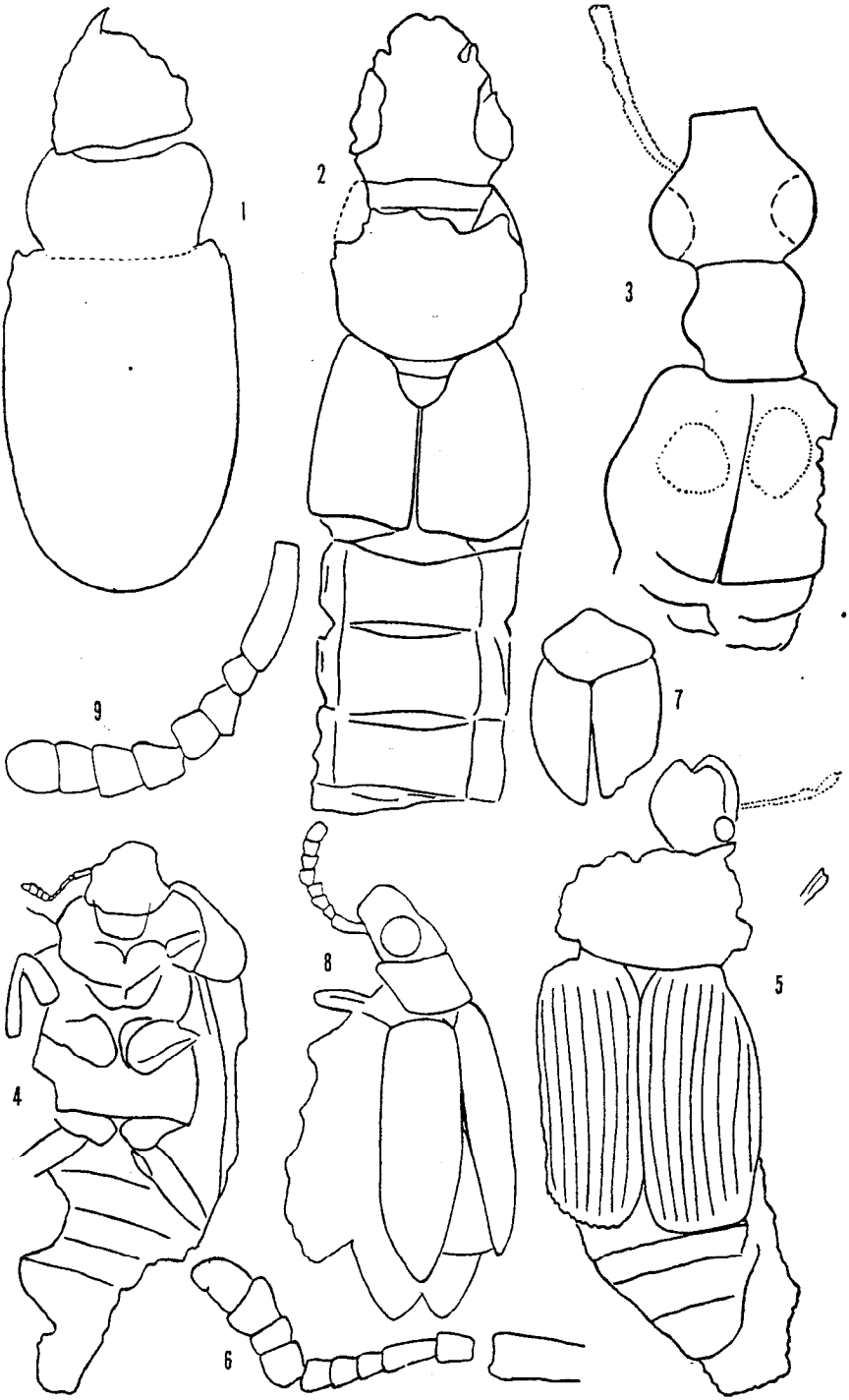
Plate VII.

1. Bruchus henshawi n. sp.
2. Bruchus exhumatus n. sp.
3. Bruchus florissantensis n. sp.
4. Bruchus haywardi n. sp.
5. Bruchus haywardi.
6. Bruchus bowditchi n. sp.
7. Bruchus scudderi n. sp.
8. Bruchus scudderi.
9. Bruchus osborni n. sp.
10. Bruchus exhumatus, antenna.
11. Bruchus scudderi, antenna.
12. Bruchus haywardi, antenna.
13. Bruchus bowditchi, antenna.
14. Bruchus henshawi, elytral punctuation.

Plate VIII.

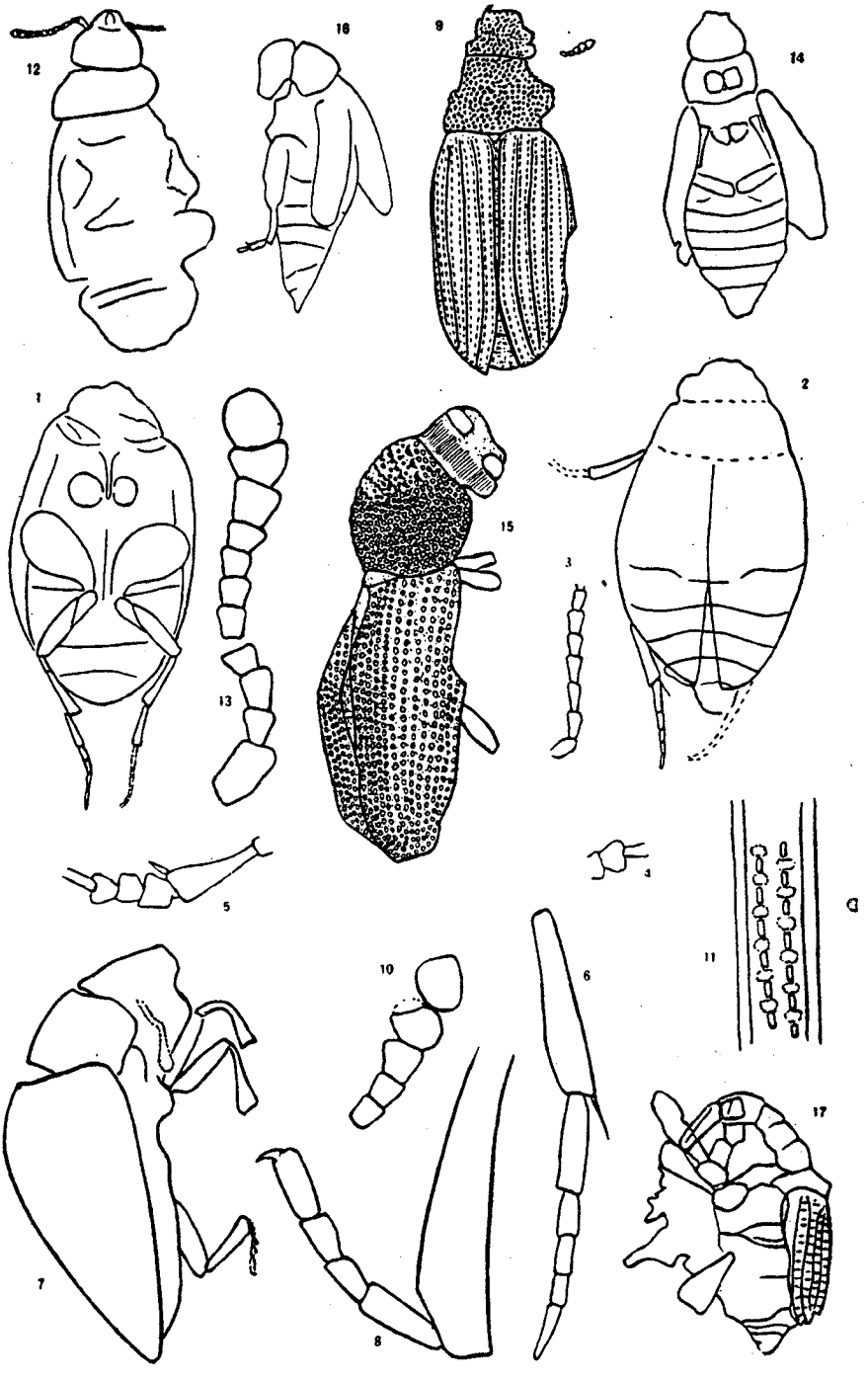
1. Docirhynchus ibis n. sp.
2. Leptura petrorum n. sp.

PLATE I



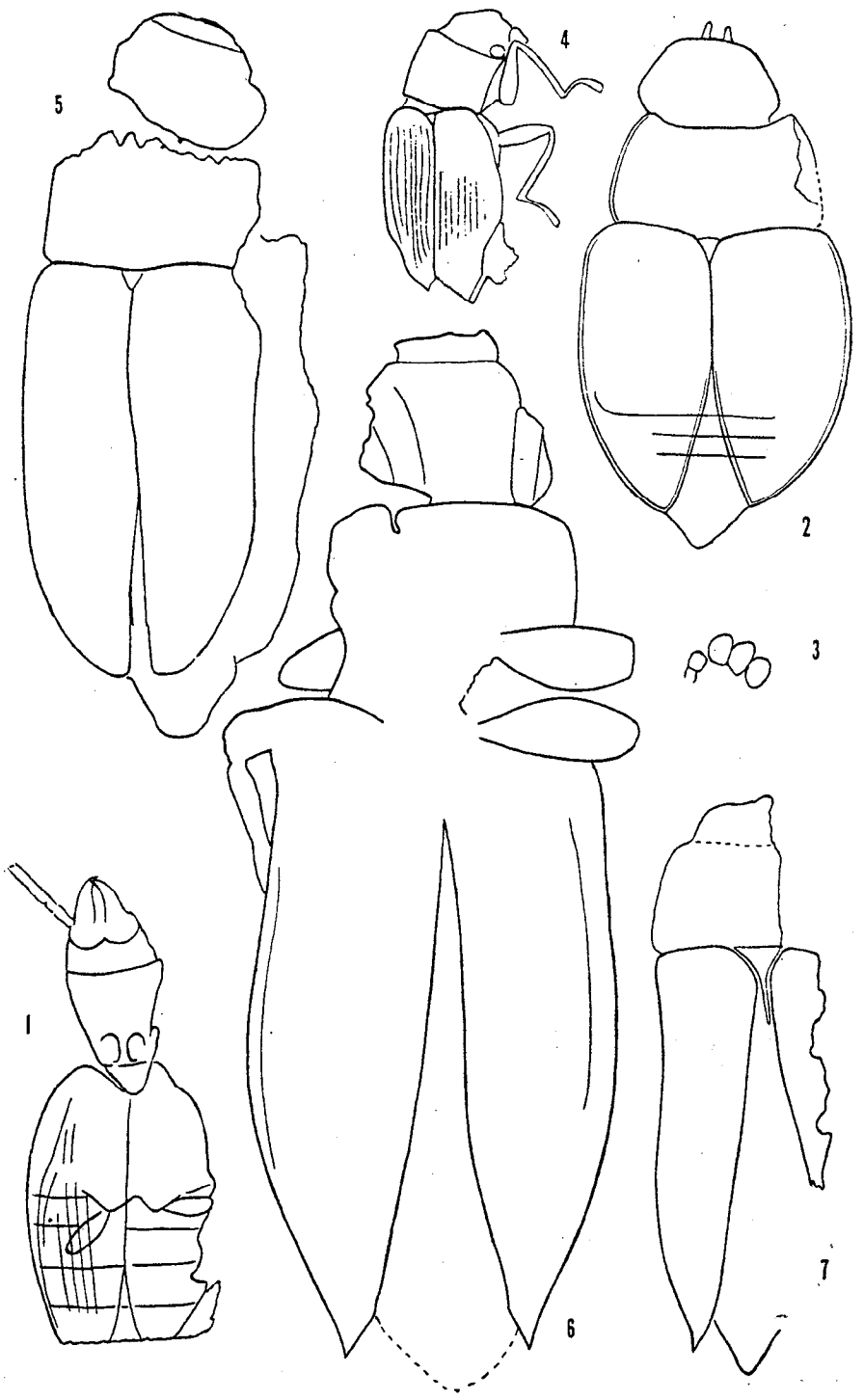
FOSSIL COLEOPTERA FROM FLORISSANT

PLATE II



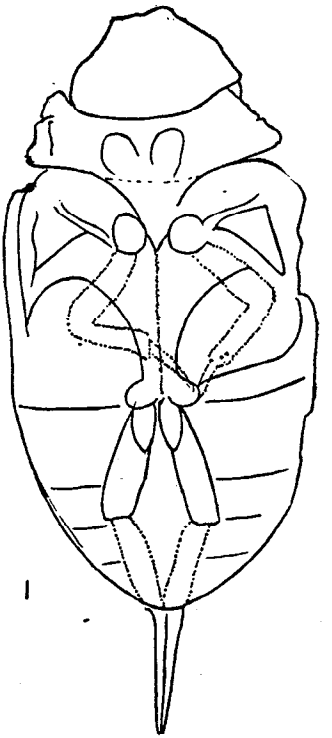
FOSSIL COLEOPTERA FROM FLORISSANT

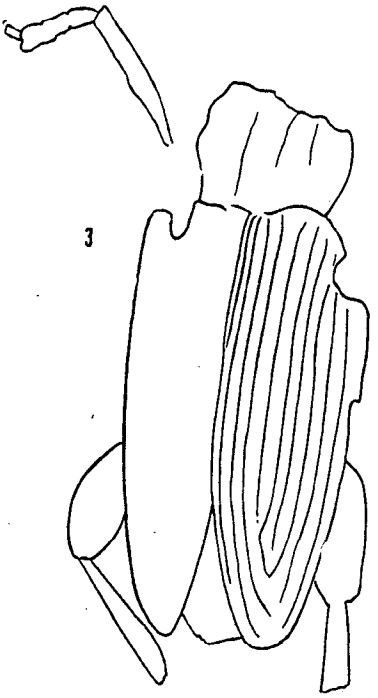
PLATE III

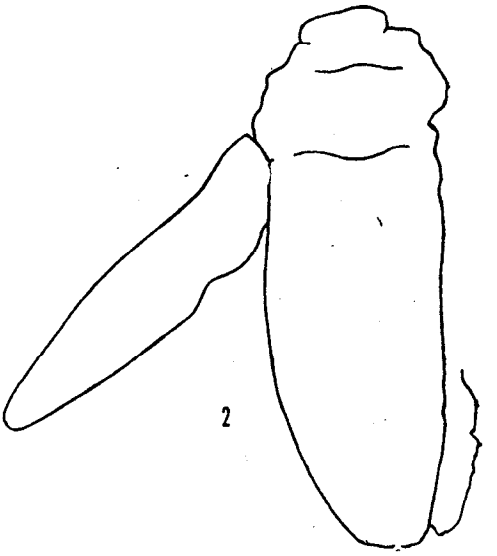


FOSSIL COLEOPTERA FROM FLORISSANT

PLATE IV

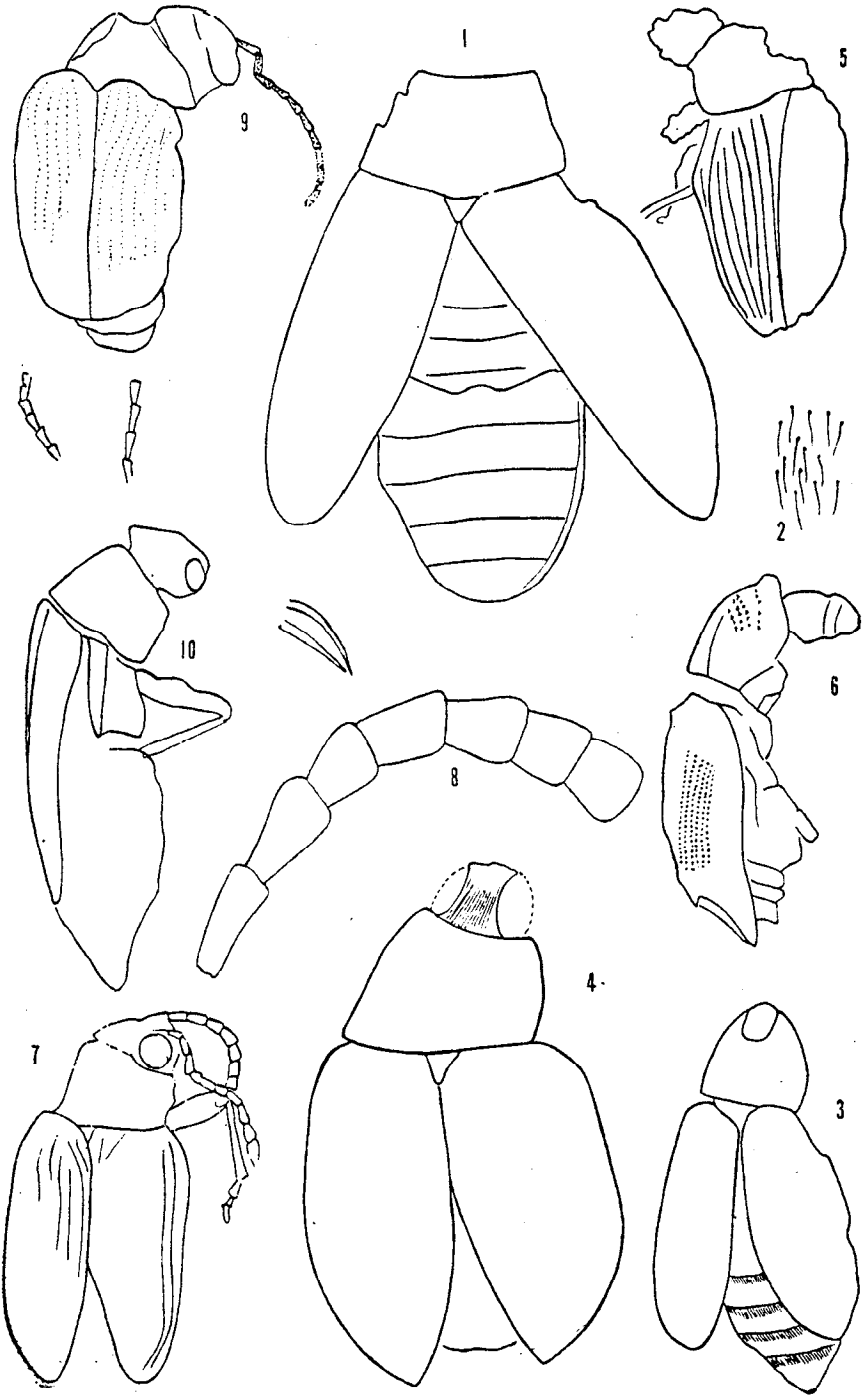






FOSSIL COLEOPTERA FROM FLORISSANT

PLATE V

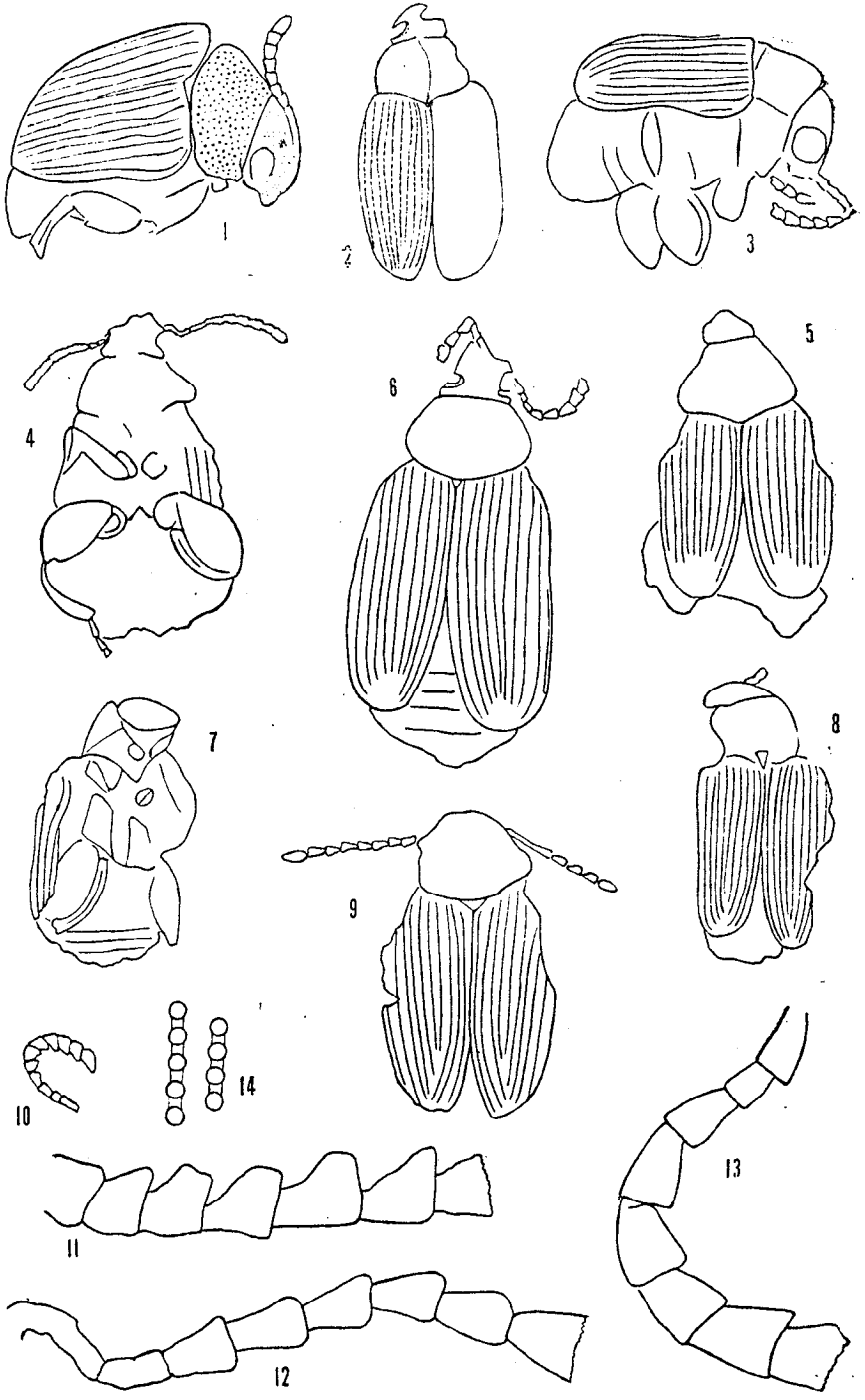


FOSSIL COLEOPTERA FROM FLORISSANT

PLATE VI

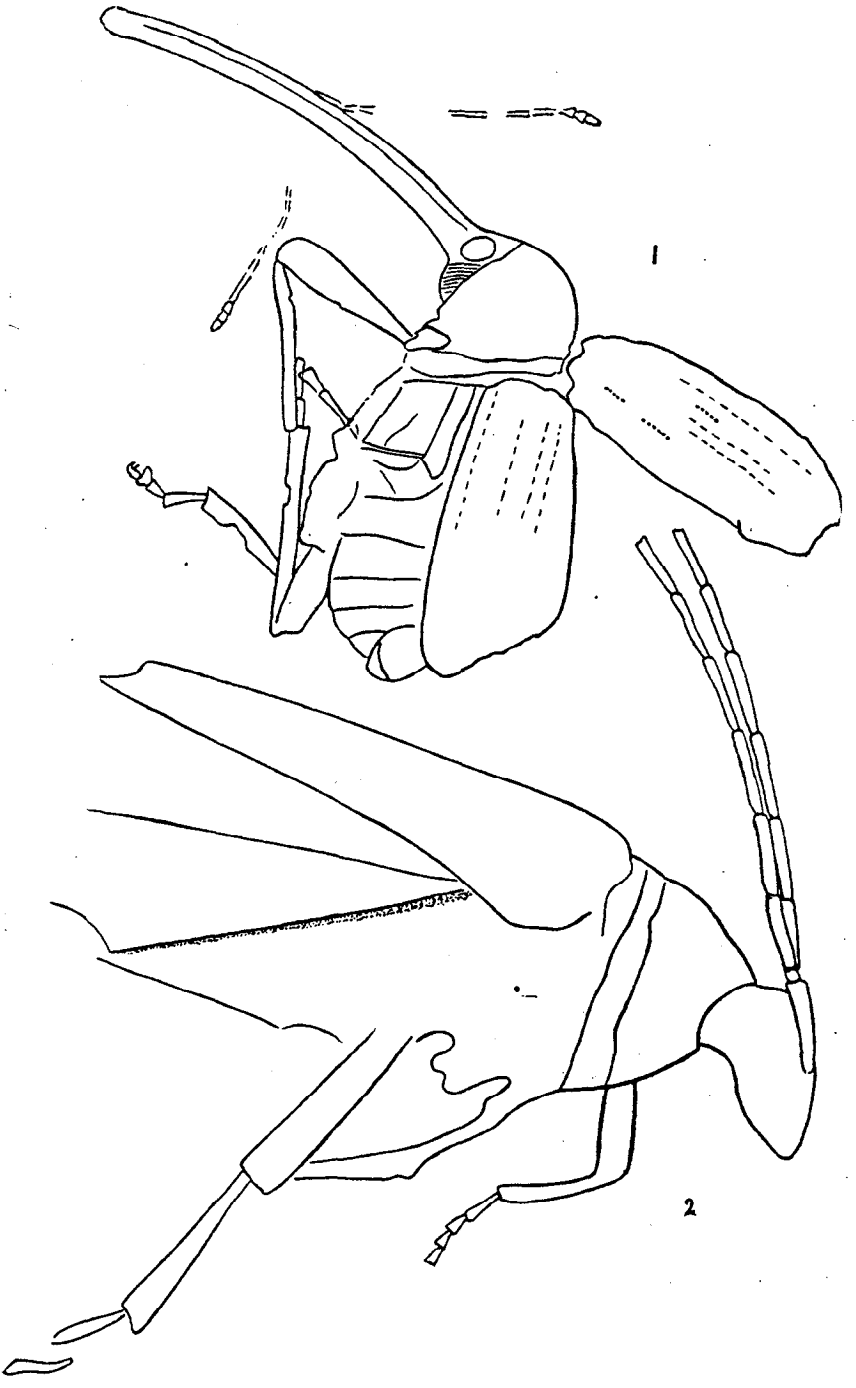
FOSSIL COLEOPTERA FROM FLORISSANT

PLATE VII



FOSSIL COLEOPTERA FROM FLORISSANT

PLATE VIII



FOSSIL COLEOPTERA FROM FLORISSANT